

# ***RI*Grunner**

*for models*

**4004USB**

**4005**

**4005H**

**4008**

**4008H**

**4012**



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Thank you for choosing the West Mountain Radio RIRunner! You will enjoy having a RIRunner with durable, standardized Powerpole connections. Having proper DC distribution should make a long overdue improvement to the convenience and safety of your station. The RIRunner is a simple device, with obvious function. Think of a RIRunner as the 12 volt equivalent of a 120 VAC power panel in a house.

There are some considerations to think about. Please read these instructions carefully before setting up your RIRunner.

## **Choosing a mounting location**

Pick a location that is close, or central to, most of your radios and accessories; especially those that draw large amounts of current. Locate your power source as close as possible to the RIRunner. Remember that every wire has resistance, longer wires have more resistance. More than a 10' run of #10 wire is not quite adequate to supply the RIRunner to full output without a significant voltage drop.

Install in a cool dry place with good ventilation. For example, do not put it on top of your amplifier or room heater, or cover it with something. It is recommended to not put it in the engine compartment of your car, or directly on the floor of a car; rain from open windows or snow covered boots may cause water damage.

## **Connecting your equipment**

Recognizing that RIRunner comes standard with Powerpoles, updating your cables that supply or use 12 volts DC with Powerpoles will improve the convenience of quick connections and use of your equipment. Remember, Powerpoles are genderless and the same connector arrangement works for both supply and load. Powerpoles can be used to charge or power batteries, all using the same connectors.

Powerpoles can be installed by soldering or crimping. Be sure to make good connections. For detailed Powerpole connector installation tips see RIRunner support pages at <http://www.westmountainradio.com/supportrr>.

**IMPORTANT!!** It is essential that assembly of the pairs is correct. Follow the amateur radio standard used by the RIRunner. **DO NOT PLUG IN** without verifying that **RED + PLUS** and **BLACK – MINUS** is correct.

The far left connector is labeled DCIN with a 40 amp fuse, and is normally used to connect to the power supply; but, any output may be used as the input with an appropriate fuse. Plug in your equipment starting with the highest power connections to the left and the lower power drain units to the right, notice the supplied fuse ratings next to the connector chosen. Typically 12 volt input amplifiers and 100 watt RF output transceivers should be first, VHF radios next and smaller accessories last.



Multiple amplifiers and/or transceivers may be connected to the RIRunner. There is a 40 amp maximum that would be exceeded if trying to transmit all connected units at once. Most radios and amplifiers draw less than 3 amps in receive, but require many more amps in transmit. Therefore, the limiting factor is total current draw while transmitting. To determine how many radios may be used to transmit at one time, consult the radio manual for power consumption specifications. In the event that the total current goes over the 40 amp maximum, a fuse will blow or make an undersized power supply unhappy. The RIRunner and any equipment plugged into the RIRunner should go unharmed.

## Using the proper fuses

The RIRunner comes supplied with a range of fuses installed. This assortment should be suitable for most stations, but can be changed easily. Every RIRunner output is safe up to 40 amps, but the total allowable is also 40 amps.

A fuse **MUST** be in each position in use. **ANY ATTEMPT TO BYPASS OR SHORT ACROSS THE FUSES IS DANGEROUS AND VOIDS THE RIGRUNNER WARRANTY.** Since the maximum available automotive fuse is 40 amps, the RIRunner will be protected as long as any value ATC/ATO fuse is installed. Choose the correct fuse for your equipment. Standard ATC/ATO automotive blade fuses are used. These fuses are available in 10 values ranging from 1 amp to 40 amps.

The DC input should have a fuse that is appropriate for the power supply rating. If using a smaller power supply, consider using a lower value fuse than the 40 amp value supplied. Ideally all of the outlets should have a fuse that is the next higher value above the maximum current draw of the unit on that fuse. If using a power cord with a fuse, match that value or go one or two values higher. Sizing each fuse for each unit is desirable, but not absolutely necessary. Having a higher value than the minimum will offer less protection for that unit, too low a value and the fuse will blow out prematurely.

Note that each fuse position has a LED blown fuse indicator that will conveniently light up if an output fuse is blown. There must be power to the RIRunner and a load on the circuit that has the blown fuse for the blown fuse LED to light.

## The voltage comparator and audible alert

A feature of the RIRunner 4012 and 4008 is the precision expanded scale voltage comparator display with audible alert. (The 4005 and 4004U models do not have this feature.) A basic explanation of 12 volt systems will aid in understanding this feature. Equipment commonly referred to as 12 volt is actually a nominal 13.8 volts. For example, a lead acid battery is a nominal 12.6 volts when charged and not under load, and approximately 14.0 volts under charge. A quality 12 volt power supply will have its regulated output set to 13.8 volts. Most radios are specified to require 13.8 volts +/- 15%. 12 volt automobile or aircraft alternators have voltage regulation set between 13.5 and 14.3 volts.

The RIRunner provides an accurate and unambiguous display of voltage. There are three LEDs: red overvoltage, green normal, and yellow undervoltage. The points at which the LEDs change are set accurately to 11.5 and 15.0 volts. The selection of these points gives a reliable indication of proper and safe operation of your power supply, battery or alternator. A green or normal indication is all you need to look for.

An undervoltage indication, shown by the yellow LED, is less than 11.5 volts. This should be safe for your radio, but may cause improper operation. Low voltage on a modern radio can cause a loss of phase lock and a frequency error. This is a definite indication of a problem with the power source; a bad connection, an unregulated power supply, a bad alternator or dying battery. It is normal with most cars to have less than 11.5 volts when cranking the starter motor.

A normal indication with the green LED illustrates, everything is good and you are between 11.5 and 15.0 volts, don't worry about a thing.

A red overvoltage indication with the red LED is a warning, **DISCONNECT OR TURN OFF YOUR POWER SUPPLY IMMEDIATELY!** It is possible to overheat or damage a radio or other equipment. An overvoltage will sound an audible alert; no need to watch the LEDs to signal a problem.

When running strictly on a 12 volt battery, an overvoltage condition will not occur. The RIRunner's audible alert can be reconfigured for a low battery warning. By removing the four cover screws and move the P14 jumper to the "LO" position. Remember to move it back to "HI" when changing back operation from power supply or alternator.

**Note:** Due to the characteristics of the comparator chip it is normal for the undervoltage LED to glow very dimly with a normal or overvoltage indication. It is also normal for the LEDs to change intensity while stepping through 10 precision points.

In the event of a bad power source or power connection, the yellow LED may flash or come on during transmit. If this happens, check the power source and connections. It is also possible for RF from a transmitter to cause an electronically regulated power supply to lose regulation and cause an overvoltage alert during transmit. The RIRunner is extensively RF bypassed and should actually cure this problem. If you do have an overvoltage condition during transmit especially with a VHF high power amp, it is due to inadequate RF filtering on the DC lead of the amplifier, or poor RF immunity of the power supply regulator circuit.

#### RIRunner 4004USB:

The USB charge ports may be used to provide power to USB devices, such as phones and tablets. The USB port follows both the USB organization's dedicated charge port (DCP) specification and Apple's unique charge port - meaning both Apple or Android phones and tablets or DCP devices will be provided power.



The USB ports contain a 5V regulator that can provide up to 4A of current (4A is the combined maximum current of both ports.) However, the USB DCP and Apple devices are requested by the 4004USB to limit their load currents: Apple devices are limited to 1A of power and DCP devices are limited to 1.5A. This would mean the worst case current used by the USB ports would be 3A at 5V, when these devices follow the limits requested by the 4004USB. The 5V regulator is powered by the 12V supplied into the powerpole labeled "DCIN".

The RIGrunner 4004USB has a green LED indicating when the unit is being powered.

## **Powerpole® Wiring Guide**

<b>Powerpole Series Contact</b>	<b>Recommended Wire Gauge</b>
<b>15 A</b>	<b>20-16 AWG</b>
<b>30A</b>	<b>20-12 AWG</b>
<b>45A</b>	<b>14-10 AWG</b>

***Additional Resources for Anderson Powerpoles  
go to: [www.andersonpower.com](http://www.andersonpower.com)***

***Details and a video demonstration for using PWRcrimp  
Tool with powerpoles, go to:  
[www.westmountainradio.com/crimptool](http://www.westmountainradio.com/crimptool)  
[www.westmountainradio.com/videos](http://www.westmountainradio.com/videos)***

### **ADDITIONAL RESOURCES**

Go to our support page for more assistance:  
**<http://www.westmountainradio.com/supportrr>**

Go to our OpTips page for connection tips:  
**<http://www.westmountainradio.com/optips>**

## **RIGrunner Accessories**

	<b><u>Order Sku#</u></b>
<b>Fuse Assortment Low Value (8pcs)</b> 3- 1A, 3- 5A & 2- 10A	<b>#58537-1085</b>
<b>Fuse Assortment High Value (8pcs)</b> 2 ea. of 15A, 20A, 30A, 40A	<b>#58537-1086</b>
Buss 10A ATC Circuit Breaker	<b>#58537-1087</b>
Buss 15A ATC Circuit Breaker	<b>#58537-1088</b>
Buss 20A ATC Circuit Breaker	<b>#58537-1089</b>
Buss 25A ATC Circuit Breaker	<b>#58537-1090</b>
Buss 30A ATC Circuit Breaker	<b>#58537-1091</b>
<b>Powerpole Extension Cable, 3 ft.</b> #12 Red/Black Wire w/ powerpole ends	<b>#58531-1082</b>
<b>Powerpole Extension Cable, 6 ft.</b> #12 Red/Black Wire w/ powerpole ends	<b>#58531-1083</b>
<b>Powerpole Extension Cable, 10 ft.</b> #12 Red/Black Wire w/ powerpole ends	<b>#58531-1084</b>
<b>15A. Powerpole Connector-12 Pair</b>	<b>#58257-1093</b>
<b>30A. Powerpole Connector-12 Pair</b>	<b>#58257-1095</b>
<b>45A. Powerpole Connector-12 Pair</b>	<b>#58257-1099</b>
<b>Powerpole Retention Clips - 12 Pack</b>	<b>#58257-1092</b>
<b>PowerLock - RIGrunner Retainer Kit</b>	<b>#58512-1060</b>
<b>PWRcrimp Crimp Tool</b>	<b>#58568-1049</b>

*To purchase or view other accessories available,  
call or go online at:*

**[www.westmountainradio.com/shop](http://www.westmountainradio.com/shop)**

## ***RIGrunner Warranty***

The RIGrunner is warranted against failure due to defects in workmanship or materials for one year after the date of purchase from West Mountain Radio or an authorized dealer. If purchased from an authorized dealer it must be returned with a copy of the original sales receipt or proof of purchase.

Warranty does not cover damage caused by abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation, alteration, lightning, or other incidence of excessive voltage or current. If failure occurs within this period, return the RIGrunner or accessory to West Mountain Radio at your shipping expense with a full explanation and necessary proof of purchase. The device or accessory will be repaired or replaced, at our option, without charge, and returned to you at our shipping expense. Repaired or replaced items are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the RIGrunner or accessory made after the expiration of the warranty period.

West Mountain Radio shall have no liability or responsibility to customer or any other person or entity with respect to any liability, loss, or damage caused directly or indirectly by use or performance of the products or arising out of any breach of this warranty, including, but not limited to, any damages resulting from inconvenience, loss of time, data, property, revenue, or profit, or any indirect, special incidental, or consequential damages, even if West Mountain Radio has been advised of such damages.

Except as provided herein, West Mountain Radio makes no express warranties and any implied warranties, including fitness for a particular purpose, are limited in duration to the stated duration provided herein.

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